Drell-Yan Type Processes

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Lectures

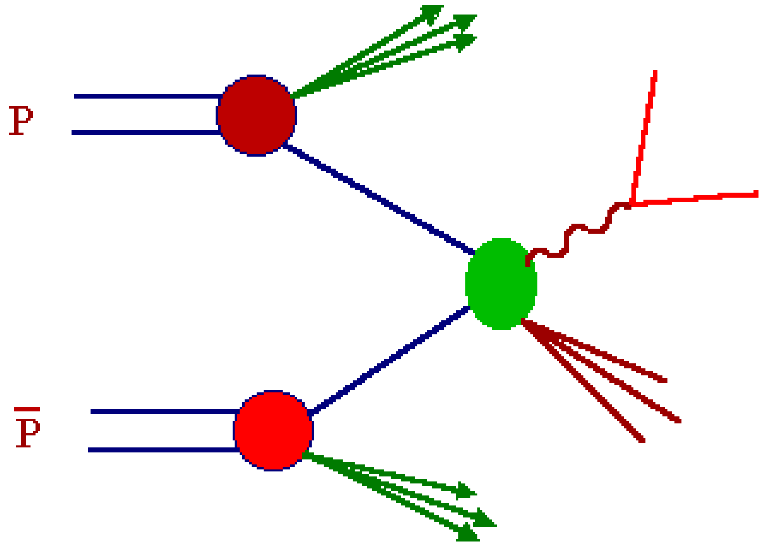
1. **A NLO Calculation of pQCD: Total Cross Section of $P\overline{P} \to W^{+} + X$**

2. **Rapidity Distribution**

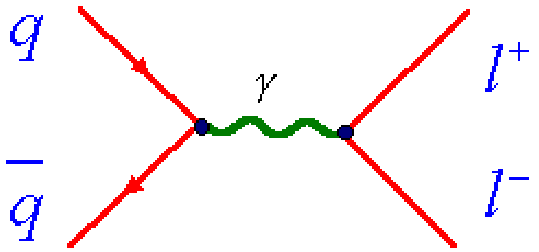
3. **Transverse Momentum Distribution: Effect of Multiple Gluon Emission: Soft Gluon Resummation**

Drell-Yan Process

For example, at the Fermilab Tevatron, which is a proton-antiproton collider, a muon pair can be produced from the collision of the collider beams. Symbolically, it is represented by



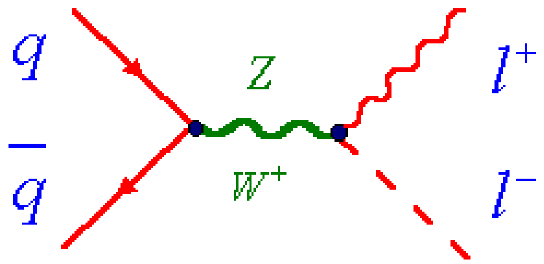
where the constituent process is represented by



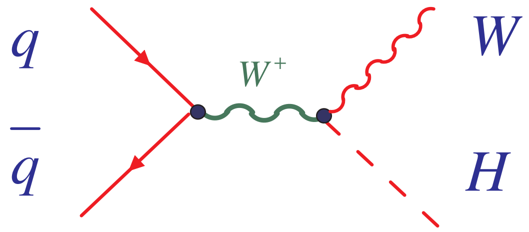
with $\ell^\pm = \mu^\pm$ and the virtual vector boson is predominantly the virtual photon when the invariant mass of the muon pair is small.

Drell-Yan Type Processes

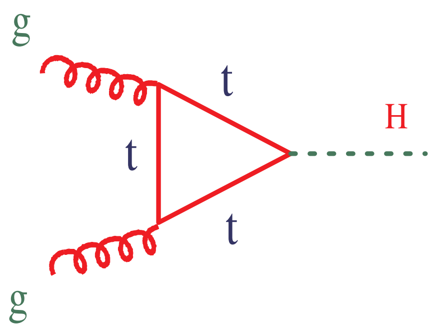
- $h, h'(q\bar{q}') \to W^+ \to \ell^+ \nu$
  $h, h'(q\bar{q}) \to Z \to \ell^+ \ell^-$



- $h, h'(q\bar{q}') \to W^* \to W^+ H$
  $h, h'(q\bar{q}) \to Z^* \to ZH$



- $h, h'(gg) \to H$



In the above, $W^\pm$ and Z are weak gauge bosons, and H is the Higgs boson.